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Future System Operation
Office of Gas and Electricity Markets
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1st September 2021

Dear Sir or Madam

Ref : Future System Operator (FSO) Consultation

Thank you for the opportunity to respond to BEIS/Ofgem's Future System Operator consultation. Please find below E.ON's response.

Summary

The role of the energy system operator (be that power or gas) is a vital part of the whole energy system. They have a unique position in being experts in all aspects of delivering energy, from the minute-by-minute balancing of energy through to the long-term planning of how to deliver the future energy requirements of the country. Therefore, in this necessarily fast paced drive to a Net Zero economy, it is essential to have strong, but independent system operators, acting across as many different energy vectors as needed, which can help to deliver a low carbon, secure, safe and efficient energy system at least cost to the customer. Therefore, we are very supportive of BEIS/Ofgem's review of the roles and responsibilities that a future system operator (FSO) may need to have, as well as considering the best governance structure that can deliver this successfully.

We believe that the benefits of planning (and operating) the energy system on a holistic basis are significant. As such we are in agreement with this consultation that the electricity system operator (ESO) and the gas system operator (GSS) role should be combined to ensure synergies and cross commodity benefits are fully realised. It could be argued that these benefits do not require a single FSO role, and that greater coordination will also deliver the bulk of the benefits, but it is our belief that siloed thinking would continue across two independent companies with separate boards. We acknowledge BEIS/Ofgem's concerns around the safety case of separating the day to day system operation of gas from the assets that are needed to do that

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balancing e.g. linepack, storage etc but we would like to see further analysis as to the cost benefit of all potential solutions to this problem. We believe that the synergies and integrated thinking of a combined control room ought to deliver significant benefit to the country as a whole, especially as hydrogen becomes a bigger energy source with its production inextricably related to electricity.

We are also convinced that even greater value can be achieved by extending the amalgamation of system operation to distribution networks as well, especially with regard to electricity. With the need for distribution system operator (DSO) functions starting to emerge and expand for an ever-decentralising system, now would seem the perfect time to revisit the centralisation of all system operation as proposed as one of the options in the Open Network Project's Future Worlds consultation¹.

Our preference would be for the FSO to be a privately owned company whose role and influence on the system would be regulated through a price control in a very similar manner to the ESO price control today. We believe that the FSO needs to be an agile participant (quick to react to new business models and technologies) which we believe would be hampered by making it publicly owned and hence bound by significant bureaucracy and processes. We do acknowledge that financing may be an issue for a privately owned company and therefore we would like to see the Government act as a 'bank of last resort' for the FSO to ensure that it has the financial resilience that it needs to deliver.

Questions:

1. Do you agree that net zero will create the need for new technical roles in the electricity and gas systems, and require a new approach to energy system governance?

We are in totally agreement with BEIS and Ofgem that Net Zero creates the need for a more holistic view of the electricity and gas industry and potentially other related fields such as transportation. Electrification of many different processes currently using fossil fuels will be a large part of Net Zero. As such there is a need to technically understand impacts to existing systems and networks of such a wholesale move from fossil fuel sources of energy to electricity and to investigate more optimal solutions than those used today that were designed for a different world. Even consideration of the 'simple' shift from dispatchable fossil fuelled generators to intermittent renewables needs to understand what solutions can be used to minimise the cost of such a change. Adding the complication of more integration between power and gas (through electrification of heat, retaining but minimising the use of gas as a fuel for power generation and in the longer term the interrelationship between electricity and hydrogen) creates an urgent need for an integrated system operator who can understand and exploit all these interrelationships. The current model of two system operators worked when the only linkage between gas and power was that of gas fired power generation, but

¹ <https://www.energynetworks.org/assets/images/Resource%20library/ON19-WS3-Baringa%20Future%20World%20Impact%20Assessment%20report-PUBLISHED%20060319.pdf>

this is not where Net Zero is taking us and as such we need a single system operator with expert understanding of how to take advantage of these linkages to minimise the cost of delivering Net Zero.

There has been some recent discussion around allowing the market to find its own solution through decentralisation of system operation 'powers' and retaining a centralised system operator for emergency purposes only. This idea believes that the future energy system will be too complex for an unwieldy centralised system operator to make the right decisions fast enough. Proponents of this view point to the internet as an example of where this approach works well (i.e. there is no single controlling entity to the internet but rather a multitude of algorithms looking to optimise on a local level). Whilst this maybe true for the internet, we believe that the importance of the energy system to the lives and wellbeing of all the people in the UK should preclude such dramatic (and untested) changes. It maybe that the current energy digitalisation taskforce (EDiT) recommends decentralisation as a way forward, but at E.ON are yet to be convinced of the safety and security of not having a centralised system operator with ultimate accountability for balancing the energy system.

2. Do you agree that the establishment of a Future System Operator is needed to fulfil the kinds of technical roles needed to drive net zero?

Yes, we support the establishment of a Future System Operator (FSO) with the necessary skills and powers to support the UK's move towards Net Zero. Whilst the technical expertise on power and gas already exists separately in the ESO and GSO, it will be the creation of expertise in the interplay between these two systems, that would be difficult if not impossible with separate system operators that will generate the most value from the future integrated system.

3. Do you agree that a Future System Operator should have roles in both the electricity and gas systems?

Yes, see our response to Q1

4. Do you agree that a Future System Operator should be entirely separate from National Grid plc?

We believe that it is essential to separate the FSO from any other part of the system that has a commercial interest. We acknowledge that there is no cause to believe that National Grid plc have taken advantage of the conflicts of interest inherent in the current governance structure of the group i.e. one part of the group making decisions about long term investment required for the networks whilst the other parts of the group having a commercial interest in bidding for any work identified. However, a lot of regulatory resource has (and will need to continue to be) expended making sure that customers are not being exploited as well as NGT/NGESO resource in demonstrating their independence. So even the perception of conflicts of interest cause inefficiencies to enter the system. Therefore, to maximise the value to customers, it is vital to have total separation between the system operator and any other commercial party.

5. What issues are there with existing institutional arrangements in the UK energy system in relation to system-wide decision-making and planning?

Whilst there is much good will between system and network operators towards working more closely together e.g. Open Networks Project is looking at primacy rules between the ESO and DNOs for dispatch of embedded generators, the current institutional arrangements and different commercial interests that divide up the system between power and gas, transmission and distribution etc will always retain the issue of the division of value between each party compared to the value to the system as a whole. With a single and integrated system operator across power, gas, transmission and distribution then all of the value can be ascribed to that one party who will (as part of their price control) share this with customers.

6. What examples/case studies are you aware of where net zero delivery in one part of the energy system did not adequately account for cross-system impacts or costs?

Whilst we are not aware of any reported examples of actions in one part of the system causing issues for another part of the system (other than anecdotally), we do see a lot of resource going into trying to mitigate this problem. As more and more distributed energy resources (DER) are installed, and electrification of transport and heat becomes more prevalent the chances of unintended consequences will grow, especially when flexible DER will need to have a commercial relationship with both the ESO and the DNO. Despite best endeavours, it is likely that not all issues will be accounted for and the risk of 'clashes' (where the ESO takes an action that causes a problem for the DNO and vice versa) will also grow, especially as more and more different types of markets are introduced (such as inertia, voltage control etc). If and when hydrogen becomes a major fuel, then both its production (via electrolysis) and its use to generate power will also have to consider impacts on the power and gas networks, especially in the absence of major hydrogen storage facilities.

7. Where should government focus in our efforts to improve systems thinking and coordination across the energy system?

Our belief is that in the short to medium term the biggest source of risk (and value) in terms of whole system optimisation is between the transmission and distribution electricity system. Whilst gas and electricity planning could see large potential synergies, it is the operation (and planning) across the voltage levels of electricity that is going to see the most protracted issues. We acknowledge the work that is ongoing at Ofgem and BEIS to understand the Distribution System Operator (DSO) transition, but we believe that this is currently 'nibbling at the edges' of the problem. One example is the work on DNO's Long Term Development Statements (LTDS) which is only considering a tiny aspect of the whole system planning process. We believe a more holistic approach is needed from the start to tackle the issues of what is the best governance structure for whole system planning. And whilst we also acknowledge that DNOs are best placed to initiate the creation of DSOs, this should be in the context of a review as to the best model for the long term. The 'Future

Worlds² work initiated by the Open Networks Project was an excellent start to this process, but Ofgem and BEIS do not seem to have taken up the challenge of taking this forward. Continuation and reaching a conclusion on this topic would be our top priority for Government and Ofgem.

8. Do you agree that the FSO should undertake all the existing roles and functions of NGEOS? If not, please explain why.

We believe that the rationale for NGEOS performing all of its current activities is not changed by moving to a FSO structure and therefore agree that the FSO should undertake all the existing roles and functions of NGEOS.

9. Do you agree there is a case for the FSO to undertake the long-term strategic functions outlined in Option 1? Please elaborate and provide any views on the functions we have outlined in Option 1.

The long-term strategic functions of strategic network planning, long term forecasting and market strategy functions for both gas, electricity and the integration of the two are vital to keeping delivery of Net Zero at least cost. Therefore we are in total agreement with BEIS/Ofgem as to the case for these functions to form part of the new FSO.

10. Do you agree that there is not currently a case for the FSO to undertake all GSO roles and functions, including real-time gas system operation, as outlined in Option 2? If you do not agree, please explain why.

We acknowledge the concerns that BEIS/Ofgem have outlined in the consultation around the safety case of real time gas system operation. However, we believe that mitigation of these issues (access to network assets such as linepack and compressors to maintain safe levels of pressure) should be further investigated. The benefits of an integrated gas and power system operator will start to become very stark if and when hydrogen becomes a major fuel that is much more integrated with the power system (such as green hydrogen production and hydrogen as a long duration flexibility option for the power system). Therefore, we would like to see Ofgem and/or BEIS conduct a more detailed cost benefit analysis of the operational synergies between gas and power (including green hydrogen production). The impact assessment released with this consultation appears to focus more on costs and benefits of planning synergies, but we believe the larger 'reward' of an integrated control room is through tackling the increasing issues of balancing the electricity system i.e. BSUoS constraint costs alone are forecasted to quadruple before the end of the decade³ which will add £1.5b of cost to the electricity bill.

11. Do you have views on the proposal for an advisory role? What organisations do you consider would benefit from the provision of advice by the FSO? Who

² <https://www.energynetworks.org/assets/images/Resource%20library/ON19-WS3-Baringa%20Future%20World%20Impact%20Assessment%20report-PUBLISHED%20060319.pdf>

³ <https://www.nationalgrideso.com/document/207531/download>

should bear the costs of providing that advice?

We are in agreement with Ofgem and BEIS that the FSO should provide advice to stakeholders on issues around future network operation and costs. NGESO already provide an invaluable service through the Future Energy Scenarios which are ubiquitous to all Government and regulatory analysis as well as providing commercial actors an insight into which directions the UK energy system may evolve. This allows Government, the regulator and commercial parties to discuss and agree upon future policies and regulation based on a common understanding of the range of futures (even if they don't agree upon which scenario is more likely). The cost of the FSO having this advisory role ought to be included in its future price control (or equivalent) and as such be socialised across end users. The exception to this cost sharing model would be any advice that is not made public e.g. if Ofgem request analysis that is specific to a problem/issue that Ofgem are investigating.

12.Do you have any views on the other areas where we are considering new and enhanced roles and functions for the FSO (outlined in section 3.2)?

We do not have any strong views on the FSO taking on a streamlined dispute resolution role or a coordination role regarding energy data. However, we are strongly in favour of the FSO having an enhanced role in all strategic planning and network development functions as this is an area where the holistic view (and expertise) that the FSO is planned to have will be invaluable in reducing costs to the customer over the long term. Similarly, we agree that the FSO would be a strong candidate to lead on driving competition on energy networks due to the parallels between this work and the role of strategic planning. We keenly await to see how successfully NGESO runs the Early Competition Plan. And the FSO would also be well placed to take more of a role in supporting future market design.

Regarding coordination with distribution networks, we have highlighted (in Q7) our belief that the integration of transmission and distribution system operation is a vital component to realising the maximum synergies and whole system thinking. As such, the FSO should as a top priority look to understand how to bring these functions together at the earliest opportunity. In the meantime, the FSO and DSOs should ensure that no governance structures or processes are put in place that prevent the transference of all the system operation functions under one roof soon. Therefore, we are heartened to see that this option is very much still on the radar for the FSO should a clear benefits case be identified.

We believe that the potential additional roles around hydrogen, decarbonisation of heat and transport and CCUS should (for the moment) be constrained to advisory ones with further work needing to be done to understand what type of roles and functions are needed to support these areas.

13.What are your views on our proposed characteristics and attributes of a future system operator and how the models presented would deliver against them? Are there other characteristics or attributes that we have not yet considered?

The characteristics of technical expertise, operational excellence, accountability to the public (including delivery of Net Zero), independence and resilience all seem sufficient and necessary for the FSO. It is our belief that a standalone, privately owned model would meet all these characteristics and attributes better than a publicly owned model because it would have a regulated price control to incentivise delivery whilst not being constrained by public body bureaucracy (which is essential to demonstrate to the public its value for money, but that would act as a retardant to the quick pace that Net Zero needs to work at). A privately owned model would allow for more freedom to attract the talented and highly skilled people required to deliver for the FSO i.e., not being constrained to adhere to public sector pay structures.

However, one big constraint of the privately owned model is financial resilience. While NGESO has been part of the National Grid group, it has been able to use the group's size and asset base to ensure it has access to sufficiently 'cheap' working capital. As a standalone business, the asset light FSO will not have this capability and will need to have some backing from either an asset rich parent company who is independent of the energy industry or the Government to allow it to continue to access the necessary working capital for it to invest. For example, ESO are currently recommending that BSUoS move from an ex post variable charge (which places no risk on the ESO) to an ex-ante fixed charge (which could expose ESO to cashflow risk of hundreds of millions of pounds). Therefore, we believe a privately owned model with some form of Government backing to ensure access to cheap working capital is the best solution.

14.Are we considering the right organisation models for the FSO? And why?

The two models being considered (independent public body and standalone private body) are the two most suitable options. Making the FSO a part of the Government apparatus completely removes any independence that industry has been pushing for with a similar problem for the FSO being owned by a consortium of industry players. In our opinion, independence is the most important attribute for the FSO to have in order to encourage competition and drive down prices for customers.

15.Are we considering the right elements for the FSO's regulatory and accountability frameworks? And why?

We would like to see the 'duty to consider a set of principal objectives' as suggested for a non-private FSO to be incorporated into any license such that a private FSO is also required to deliver a cost effective, secure, reliable, efficient energy system that delivers Net Zero. These high-level requirements are too important to not make them integral to the accountability framework of any FSO.

We agree that having Ofgem regulate a privately owned FSO retains many aspects of the current model, which we believe have worked well to incentivise NGESO and NGG to move in the right direction. Moving to a non-private model will require a large transition and is likely to postpone the whole system benefits of having a FSO across power and gas.

We also concur that any Government approved Strategy and Policy Statement (SPS) should be written as to be applicable to the FSO through its regulatory requirements (in a similar manner to the high-level principal objectives already considered above). This ensures that a privately owned FSO will deliver outcomes aligned with the SPS. We also believe that license conditions can be written to ensure the FSO keeps abreast of recent developments in the energy sector (although it is hoped that a technically excellent FSO would do this as a matter of course).

16. Do you have views on the level of shareholding or control involving other 'energy interests' and the FSO at which a conflict of interest would become a concern?

As stated in Q15, independence is a vital characteristic of any FSO. We would be uncomfortable with any level of shareholding involving other 'energy interests' where that shareholding had a degree of control over the executive. Therefore, we would be comfortable with a private energy related investor holding one seat on the Board, but any number of seats more than this could give the perception of a conflict of interest.

17. Are we considering the right implications of our proposals for Elexon and Xoserve?

Given NGESO's relationship with Elexon (financially independent, no influence over Elexon's strategy and highly constrained ability to influence Elexon's Board), we do not see any serious governance implications for Elexon of the move to an FSO. Elexon could move back into National Grid's ownership or could become a not for profit, standalone agent. The governance implications for Xoserve are also minimal. There will clearly be major operational implications but we believe that these should not be insurmountable or particularly expensive to deliver.

18. What is your view on the preferred implementation approach? Please explain why.

We support Ofgem/BEIS's preferred implementation approach of moving all of the NGESO capabilities required by the FSO to the FSO on Day 1 with new roles/functions added as part of Phase 2. It is essential to make the transition as smooth as possible to avoid any interruption of NGESO and FSO's services and so where services may have to be duplicated for a short time, this is a cost that the industry needs to bear in order to mitigate serious interruptions. We also support allowing the addition of new functions/services to NGESO that will be needed by the FSO during the period that the necessary legislation is being designed. Net Zero is too important and helping keep customer bills as low as possible while delivering Net Zero shouldn't have to wait for parliamentary time.

19. Based on the areas where we are considering new and enhanced roles and functions for the FSO, which of these should be prioritised for development? Please explain why.

Whilst we acknowledge that the inclusion of distribution system operation into the role of the FSO was not considered in detail in this consultation, we believe that the efficiency gained by bringing all power system operation under one roof is significant⁴. Therefore, we believe that further investigation of consolidation the DSO roles into the FSO should be prioritised.

We also believe that the areas of most value and which will reduce costs to customers the most are around whole system planning and network development. It is these areas that are currently poorest served by having separate system operators and where perceived conflicts of interest cause the most damage.

20. What do you believe are the risks to implementation? How can these be mitigated?

The biggest risk to implementation is the potential for delays in essential services that the NGESO currently performs. These can be best mitigated (where required) by duplicating systems and processes across the NGESO and FSO during implementation to ensure that FSO problems can be solved quickly by reverting back to the NGESO as and when needed.

21. Do you have any comments on potential implications of implementation for you, your organisation, or other stakeholders?

We do not have any comments at this time

22. What is your view on the position there are likely to be cost savings across the energy system from an increased "whole system" view, as described in paragraphs 47-52 of the IA? If so, is the potential magnitude of savings illustrated fairly in the IA? If not, why not?

We are in total agreement with the impact assessment's (IA's) conclusion that there are savings to be realised across the energy system from being able to take a better whole system viewpoint. The IA postulates that these savings have a range of ~£210m to £2.5b for the power system out to 2050. We believe that the savings due to having a better whole system viewpoint should be related to a quicker realisation of the flexibility savings as identified by Imperial College and the Carbon Trust's report⁵ that suggests savings of £10-17b/pa. Therefore, our belief is that the cost savings for the FSO are likely to be towards the higher end of the range suggested in the IA.

23. What is your view on the conclusion that policy intervention is likely to increase the benefits of onshore electricity network competition, as described in paragraphs 53-59 of the IA? If you agree, is the potential magnitude of savings illustrated fairly in the IA? If not, why not?

⁴ <https://www.energynetworks.org/assets/images/Resource%20library/ON19-WS3-Baringa%20Future%20World%20Impact%20Assessment%20report-PUBLISHED%20060319.pdf>

⁵ <https://publications.carbontrust.com/flex-gb/analysis/>

We agree with the conclusion that the removal of perceived conflicts of interest is likely to increase benefits through more parties tendering due to the increased confidence in the independence of any competition. However, we believe that the proportion of costs saved (25%-50%) seems very high. We do not have any evidence to justify our belief, but if the inefficiencies were indeed this high then this would suggest that the current OFTO competitions have led to excessively high profits for the winners which we believe is not the case.

24. Do you think that the impact assessment has identified and considered the key costs and benefits of policy intervention? If not, can you provide details on other impacts that have not been considered?

We believe that the better whole system advice that a fully integrated FSO can provide will lead to wider better decision making than just network planning. With an FSO who has operational excellence on both power and gas, Government ought to be better informed for wider questions that will need answering in the mid to long terms such as the potential for domestic heating via hydrogen. It is extremely difficult to quantify this benefit, but there is less chance of making an incorrect decision about some key questions which will have an impact on £bs of future investment.

25. Do you think that the distribution of impacts is fairly represented, with impacted groups correctly identified? Outlined in table 5 of the IA.

From our perspective (as an energy firm and on behalf of our customers) we believe that the distribution of impacts is fairly represented.

26. We invite respondents' views on whether the proposals for energy system governance reform may have a different impact on people who have a protected characteristic (age, disability, gender re-assignment, marriage and civil partnership, pregnancy and maternity, race, religion or belief, sex or sexual orientation), in different ways from people who don't have that characteristic. Please provide any evidence that may be useful to assist with our analysis of policy impacts.

We do not believe that this proposal will have any sort of discriminatory impact.